

Fungal Extracts of *Talaromyces ruber*: a potential biostimulant on tomato

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INTRODUCTION

Background

- Global population growth
- Climate change
- European policies

Impacts on agriculture

Need to increase production without expanding cultivated area and while reducing inputs.

SEARCH FOR NEW SUSTAINABLE ALTERNATIVES

Biological alternatives

One promising approach is inoculating crops with beneficial microorganisms.

Endophytic fungi

Problems

Limited and variable effectiveness under field conditions

Potential solution

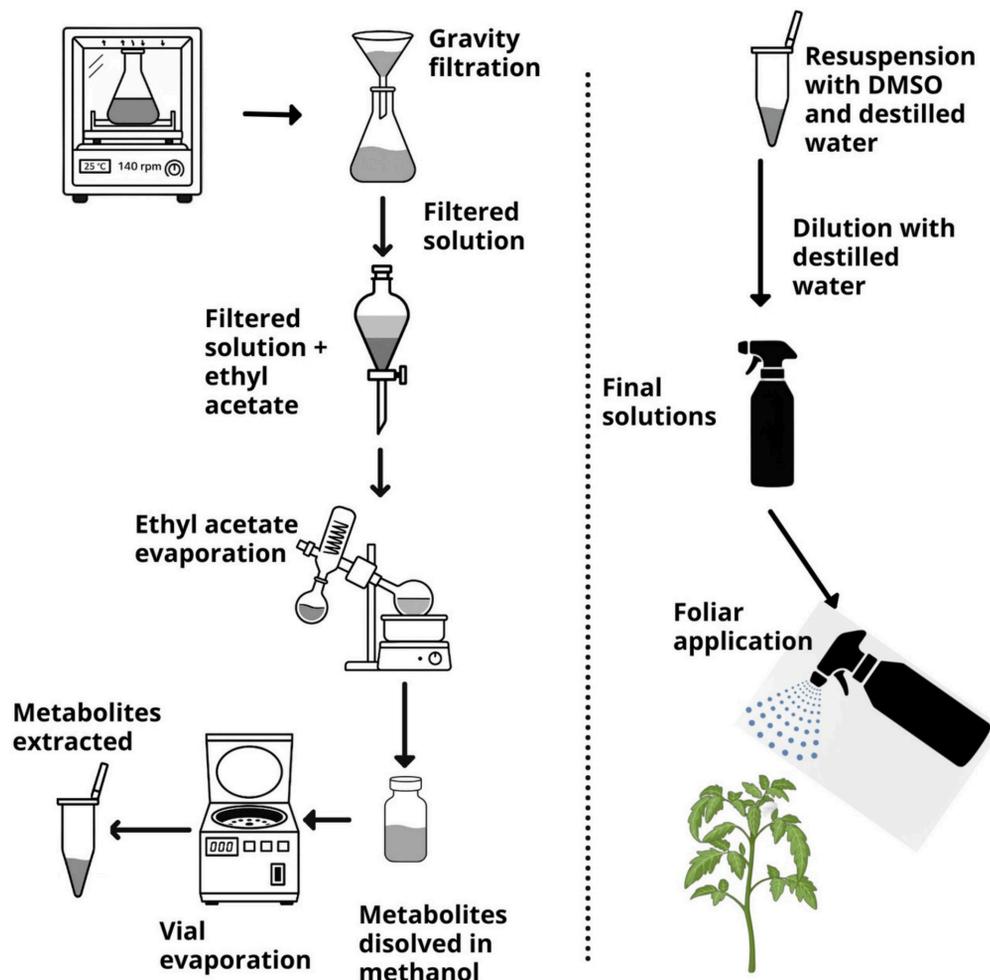
It has been shown that the beneficial effects of some endophytic fungi are driven by the production of secondary metabolites, which are the primary determinants of these benefits

Direct application of secondary metabolites could be an alternative approach that avoids the limitations associated with microbial inoculation

OBJECTIVES

To evaluate the biostimulant potential of foliar-applied secondary metabolites extracted from the endophytic fungus *Talaromyces ruber* on growth and production of tomato under saline and non saline conditions

MATERIAL Y METHODS



Measurements

- Shoot and root length and weight
- Chlorophyll, flavonol, and anthocyanin contents
- Stomatal conductance (gs), transpiration rate (E), maximum quantum efficiency of PSII (Fv/Fm), and effective quantum yield of PSII (ΦPSII).



RESULTS

Figure 1. Effect of salinity and metabolites on production per plant

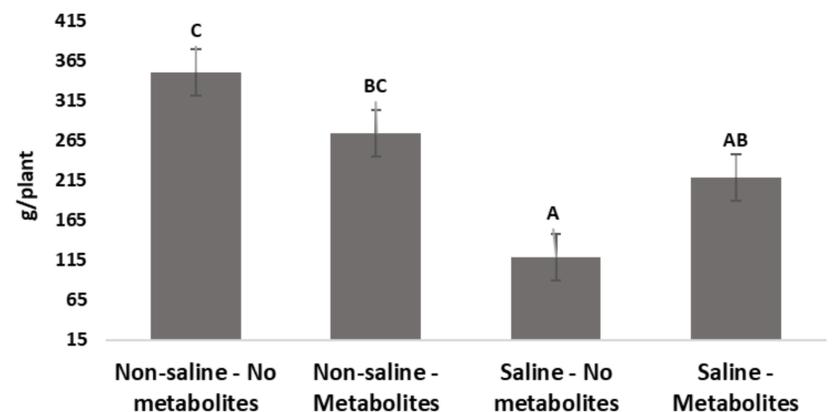


Figure 2. Effect of salinity and metabolites on tomato fruit diameter (mm)

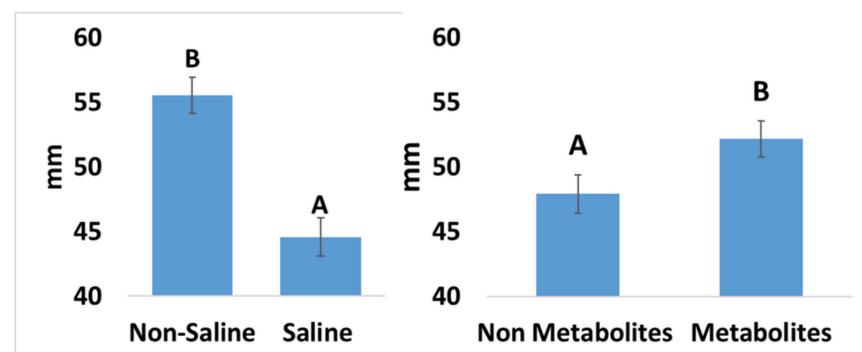
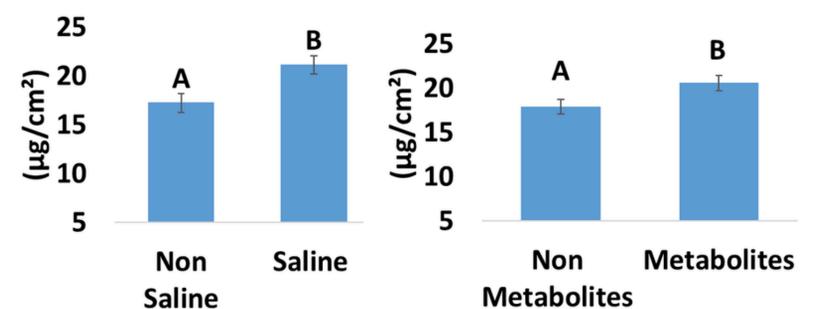


Figure 3. Effect of salinity and metabolites on foliar chlorophyll content



TO TAKE HOME

Foliar *T. ruber* metabolites did not improve yield under either saline or non-saline conditions, but they significantly increased fruit diameter, a key agronomic trait in tomato cultivation.

Chlorophyll boost: Fungal metabolites significantly increased chlorophyll concentration

Salinity effect: Higher chlorophyll levels under salt stress (likely due to reduced leaf expansion)

Mechanistic insight: Enhanced chlorophyll may partially explain improved fruit quality traits

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